

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior listings of claims in the application.

Listing Of Claims:

Claim 1 (currently amended): [[A]] An integral, substantially air impermeable polymeric membrane for use in an electrochemical apparatus or process comprising:

 a) a polymeric sheet comprising polymer and having a porous structure with a microstructure of fibrils,

 b) the polymeric sheet having distributed in the polymer:

 i) inorganic particulate;

 ii) metal;

 iii) an organic polymer; or

 iv) a combination thereof, and

 c) said porous structure being at least partially filled with an ion-exchange resin to provide ionic conductance for use in the electrochemical apparatus or process.

Claim 2 (original): The membrane of claim 1 wherein the polymeric sheet has distributed therein an inorganic finely divided powder.

Claim 3 (original): The membrane of claim 1 wherein the polymeric sheet has distributed therein a precious metal.

Claim 4 (original): The membrane of claim 1 wherein the polymeric sheet has distributed therein silica.

Claim 5 (original): The membrane of claim 1 wherein the polymeric sheet has distributed therein fumed silica.

Claim 6 (original): The membrane of claim 1 wherein the polymeric sheet has distributed therein titania.

Claim 7 (original): The membrane of claim 1 wherein the polymeric sheet has distributed therein carbon.

Claim 8 (original): The membrane of claim 1 wherein the polymeric sheet has distributed therein platinum.

Claim 9 (original): The membrane of claim 1 wherein the polymeric sheet has distributed therein platinum supported on a substrate.

Claim 10 (currently amended): ~~The membrane of claim 1~~ A polymeric membrane for use in an electrochemical apparatus or process comprising:

a) a polymeric sheet comprising polymer and having a porous structure,

b) the polymeric sheet having distributed in the polymer:

i) inorganic particulate;

ii) metal;

iii) an organic polymer; or

iv) a combination thereof, and

c) said porous structure being at least partially filled with an ion-exchange resin to provide ionic conductance for use in the electrochemical apparatus or process,

wherein the polymeric sheet is expanded porous PTFE, and said ion-exchange resin fills substantially all pores of the expanded porous PTFE.

Claim 11 (original): The membrane of claim 1, wherein the polymeric sheet has inorganic particulate distributed therein.

Claim 12 (original): The membrane of claim 1, wherein the polymeric sheet has metal distributed therein.

Claim 13 (original): The membrane of claim 1, wherein the polymeric sheet has an organic polymer distributed therein.

Claim 14 (original): The membrane of claim 1, wherein the polymeric sheet has a thickness of less than 50 microns.

Claim 15 (original): The membrane of claim 1, wherein the membrane is disposed between two fuel cell electrodes.

Claim 16 (canceled).

Claim 17 (previously presented): The membrane of claim 15, wherein the polymeric sheet has a thickness of less than 38 microns, and wherein the membrane that is disposed between said two electrodes of a fuel cell provides a steady state current of at

least 1.78 amps/cm² at 0.5 volts, with no humidification of incoming fuel cell air and hydrogen reactants, with air and hydrogen feed both at 40 psig and 25°C, and the fuel cell temperature at 50°C.

Claim 18 (currently amended): A composite membrane for use in an electrochemical apparatus or process comprising:

- a) a polymeric sheet comprising polymer and having a porous structure and a thickness of less than 50 microns,
- b) said polymeric sheet having distributed in the polymer inorganic particulate, metal, or a combination thereof;
- c) said porous structure being ~~at least partially~~ substantially filled with a polymeric gel that contains electrolyte to provide ionic conductance for use in the electrochemical apparatus or process.

Claim 19 (cancelled).

Claim 20 (currently amended): ~~[[A]]~~ An integral, substantially air impermeable composite membrane for use in an electrochemical apparatus or process comprising:

- a) a polymeric sheet comprising polymer and having a porous structure with a microstructure of fibrils,
- b) said polymeric sheet having distributed in the polymer inorganic particulate, metal, or a combination thereof,

c) said porous structure being at least partially filled with a polymer composition that contains metal salts to provide ionic conductance for use in the electrochemical apparatus or process.

Claim 21 (previously presented): The composite membrane of claim 18, wherein said porous structure is substantially filled with the polymer composition that contains metal salts.

Claim 22 (previously presented): The composite membrane of claim 20, wherein said polymeric sheet has a thickness less than 50 microns.

Claim 23 (previously presented): The composite membrane of claim 22, wherein said polymeric sheet has a porosity of 40% to 95%.

Claim 24 (previously presented): The membrane of claim 1, wherein said ion-exchange resin is fluorinated.

Claim 25 (previously presented): The membrane of claim 14, wherein the polymeric sheet has a thickness between 13 microns and 50 microns.

Claim 26 (previously presented): The composite membrane of claim 18, wherein the polymeric gel comprises a polymer with a cross-linked structure.